

5    What is claimed is:

1.        An assay for identifying a compound that modulates the activity of Bruton's Tyrosine Kinase, comprising:
  - (1) providing a cell expressing Bruton's Tyrosine Kinase;
  - 10    (2) contacting said cell expressing Bruton's Tyrosine Kinase with a test compound;  
and
  - (3) determining whether said test compound modulates the activity of Bruton's Tyrosine Kinase.
- 15        2.        The assay of claim 1, wherein said assay is a cell-based assay.
3.        The assay of claim 1, wherein said assay is a cell-free assay.
4.        The assay of claim 3, wherein said cell-free assay is a ligand-binding  
20    assay.
5.        The assay of claim 1, wherein said test compound modulates the activity of Bruton's Tyrosine Kinase.
- 25        6.        The assay of claim 1, wherein said test compound is a Bruton's Tyrosine Kinase antagonist.

5           7.     The assay of claim 1, wherein said test compound is a Bruton's Tyrosine Kinase agonist.

          8.     The assay of claim 1, wherein said test compound binds to Bruton's Tyrosine Kinase.

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          9.     The assay of claim 1, wherein said assay is for identifying compounds which will be useful for the treatment of osteoporosis.

          10.    A method for the treatment of osteoporosis, comprising administering  
15   to a patient in need thereof a therapeutically effective amount of a compound which was identified by the assay of claim 1.

          11.    A method for the treatment of osteoporosis, comprising:  
          (1) identifying a patient suffering from osteoporosis; and  
20   (2) administering to said patient a therapeutically effective amount of a modulator of Bruton's Tyrosine Kinase.

          12.    The method of claim 11, wherein said patient is identified as suffering  
          from osteoporosis by measuring the expression level of Bruton's Tyrosine Kinase in  
25   said patient.

5           13.     The method of claim 11, wherein said modulator is a Bruton's Tyrosine Kinase antagonist.

          14.     A method for the prevention of osteoporosis, comprising:  
(1) identifying a patient at risk for osteoporosis; and  
10    (2) administering to said patient a therapeutically effective amount of a modulator of Bruton's Tyrosine Kinase.

          15.     The method of claim 14, wherein said patient is identified as being at risk for osteoporosis by measuring the expression level of Bruton's Tyrosine Kinase  
15    in said patient.

          16.     The method of claim 14, wherein said modulator is a Bruton's Tyrosine Kinase antagonist.

20           17.     A method of decreasing the differentiation of osteoclast precursor cells into osteoclast cells, comprising contacting said osteoclast precursor cells with a Bruton's Tyrosine Kinase modulator.

          18.     The method of claim 17, wherein said modulator is a Bruton's  
25    Tyrosine Kinase antagonist.

5            19.     A compound capable of modulating the activity of Bruton's Tyrosine Kinase.

                 20.     The compound of claim 19, wherein said compound is identified by:  
                  (1) providing a cell expressing Bruton's Tyrosine Kinase;  
 10            (2) contacting said cell expressing Bruton's Tyrosine Kinase with said compound; and  
                  (3) determining whether said compound modulates the activity of Bruton's Tyrosine Kinase.

                 21.     The compound of claim 19, wherein said compound is a Bruton's  
 15            Tyrosine Kinase antagonist.

                 22.     The compound of claim 19, wherein said compound is a Bruton's Tyrosine Kinase agonist.

20            23.     The compound of claim 19, wherein said compound binds to Bruton's Tyrosine Kinase.